

AMENDMENTS TO THE SPECIFICATION

Page 1, before the heading "Technical Field" insert the following:

BACKGROUND OF THE INVENTION

Page 1, please delete the following heading and substitute therefor:

~~Technical Field~~ Field of the Invention

Page 1, delete the paragraph beginning at line 3 and substitute therefor the following paragraph:

The present invention relates to a display LED drive circuit for red color (R), green color(G), and blue color(B) used in an LED unit or the like disposed by a ~~in large number~~ in large numbers in an LED display device for displaying a video picture, for example, on a large-sized screen.

Page 1, please delete the foloowing heading and substitute therefor:

~~Background Art~~ Description of the Related Art

Pages 1 and 2, delete the paragraph beginning at line 9 and substitute therefor the following paragraph:

Hitherto, ~~[[a]]~~ an LED display device having a large number of LED units disposed therein for displaying a video picture on a large-sized screen is known. A display LED drive circuit of the LED unit has a structure, for example, as shown in Fig. 3. The drive circuit shown in Fig. 3 has a red display LED 1r, a green display LED 1g, and a blue display LED 1b connected in parallel for a source circuit 4, and the display LEDs 1r, 1g, 1b are connected respectively to a constant current circuit 2 or a current limit circuit, which limits an electric current to a constant quantity and to a switching element 3 in series, and then respective switching elements 3r, 3g, 3b corresponding to the respective display LEDs 1r, 1g, 1b are grounded, so that control signals are fed from control signal

input terminals 5r, 5g, 5b to the respective switching elements 3r, 3g, 3b to control opening and closing the same, thereby controlling turning ON and OFF of the display LEDs 1r, 1g, 1b as a load.

Page 3, please delete the following heading and substitute therefor:

~~Disclosure of the Invention~~ Summary of the Invention

Page 3, delete the paragraph beginning at line 15 and substitute therefor the following paragraph:

For example, in the display LED drive circuit in Fig. 3 described above, the constant current circuits 2 are provided, respectively, for the red display LED 1r, the green display LED 1g, and the blue display LED 1b. However, ~~since~~ because the constant current circuit 2 generates a large amount of heat, provision of a number of constant current circuits 2 may cause such a problem that the temperature of the entire drive circuit increases, and hence breakage or shortening of service life of the display LEDs may result.

Pages 3 and 4, delete the paragraph beginning at line 24 and substitute therefor the following paragraph:

On the other hand, in the case of the drive circuit in which the switching means and the common constant current circuits for the red, green, and blue display LEDs are employed, disclosed in Patent Document 2, the number of the constant current circuits may be reduced to prevent the temperature increase of the circuit in association with the increase in the number of the constant current circuits. However, ~~since~~ because it is necessary to provide the switching means for switching the voltage from the source circuit in sequence to the LEDs of the respective luminescent colors or the switching means for supplying display data to the driver synchronously with the switching operation, there may arise another problem such that the structure therefor is complicated and the cost increases.

Page 9, please delete the following heading and substitute therefor:

~~Best Mode for Carrying Out the Invention~~ Detailed Description of Exemplary Embodiments

Page 16, delete the paragraph beginning at line 7 and substitute therefor the following paragraph:

In the drive circuit of the first embodiment, the number of the constant current circuits 2 can be reduced to 2/3 of that in the drive circuit in the related art shown in Fig. 3. Therefore, the temperature increase of the entire drive circuit may be restrained in association with the reduction of the number of the constant current circuits 2 generating a large amount of heat. In addition, ~~since~~ because the constant current circuit 2 is expensive, the manufacturing cost can be reduced in association with the reduction of the number of the constant current circuits. The structure of the drive circuit in the first embodiment is slightly complicated in comparison with the structure of the drive circuit in Fig. 3, and hence the cost is increased correspondingly. However, the cost reduction effect described above can compensate sufficiently for the cost increase described above.

Pages 16 and 17, delete the paragraph beginning at line 22 and substitute therefor the following paragraph:

According to the display LED drive circuit in the first embodiment, ~~since~~ because the display LED circuit and the corresponding resistor circuit having the resistor 6 which generates the same potential difference as the display LED 1 are connected in parallel, and the corresponding switching elements 3, 7 are controlled to be opened and closed exclusively or inversely to each other so that the resistor circuit serves as an electric current path when the display LED 1 is turned OFF, a desired voltage can be applied to the respective display LEDs 1 and the output terminal 12 can be brought into predetermined potentials when the display LED 1b is in the ON state and in the OFF state. Furthermore, by the provision of the constant voltage diode 11, the power source voltage to be supplied to the control unit or the control circuit can be derived stably from the output terminal 12, and hence installation of the source circuit for the control unit or the control circuit is not necessary. By the provision of the third resistor 6n corresponding to the display LED 1b, the constant voltage diode 11 with small acceptable loss can be employed, whereby the power source voltage can be derived from

the output terminal 12 stably and the cost reduction is achieved.

Pages 20 and 21, delete the paragraph beginning at line 19 and substitute therefor the following paragraph:

A drive circuit shown in Fig. 2 includes display LED circuits in which the display LEDs 1b, 1g, 1r and the corresponding switching elements 3b, 3g, 3r are serially connected, all connected in series, and a resistor circuit in which the switching elements 8n, 8l, 8m and the corresponding resistors 6n, 6l, 6m are serially connected, respectively, is connected in parallel with respect to the respective display LED circuits. The resistor circuit connected to the red display LED circuit in parallel includes the cut-off switching element 9 as in the first embodiment. Control is made so that there are always inverse relationships between the switching elements 3g and 7l, between the switching elements 3r and 7m, and between the switching elements 3b and 7n as regards the opening state and the closing state, and so that the cut-off switching element 9 and the switching element 3g corresponding to the green display LED 1g disposed on the immediately upstream side thereof are brought into the same state as regards the opening state and the closing state.